REDACTED

Lawton Chiles
Governor

FLORIDA DEPARTMENT OF HEALTH

James T. Howell, MD, MPH
Secretary

May 11, 1998

[redacted]

[redacted]

As per the request of your homeowners' association, the Polk County Health Department's Radiological Health Section performed a number of gamma exposure rate measurements in the Bluffs of Christina neighborhood on May 8, 1998. These measurements were made with a Ludlum, model 12-S micro-R meter, calibrated by Ludlum on Nov. 11, 1997. This meter has also been intercompared with a pressurized ion chamber on April 29, 1998, in order to correct it's response to naturally occurring radiation such as radium-226 in the soil. These intercomparisons are performed on a routine basis using instrumentation provided by the State of Florida's Office of Radiation Control's Environmental Monitoring program. The results attached give both the uncorrected and corrected readings. The corrected readings would be the ones that would most accurately reflect the true gamma levels in your neighborhood.

As you can see, the highest outdoor gamma level measured was 29 uR/hr while the highest indoor gamma level measured was 13 uR/hr (clubhouse). The highest indoor "home" level was found to be 11 uR/hr.

Assuming 100% occupancy in the home with a reading of 11 uR/hr (24 hrs/day for 365 days/year) an individual would receive an annual gamma exposure of about 96 milliRem. This is in comparison to an individual living in a home with a gamma rate of about 6 uR/hr (the approximate average for Polk County), and receiving an annual gamma exposure of about 53 milliRem. The additional 43 milliRem per year exposure that an individual would receive living in the home in the Bluffs would be of little significant risk.

The radon test results for the four homes tested will be mailed to those homeowners within the next day or so. Along with these results will be an interpretation of the results and recommendations from the EPA and the State of Florida's Office of Toxicology. I will also enclose "A Citizen's Guide to Radon", an EPA publication dealing with this issue.

POLK COUNTY HEALTH DEPARTMENT

Daniel O. Haight, MD
Director

RADIOLOGICAL HEALTH SECTION / WATER TESTING LABORATORY
225 Avenue D, N.W., Winter Haven, FL 33881
Phone (941) 291-5204 / Fax (941) 291-5208

Lynne M. Sweeney, MD, MPH
Assistant Director

Lawton Chiles
Governor

FLORIDA DEPARTMENT OF
HEALTH

James T. Howell, MD, MPH
Secretary

If you or any of the other homeowners would like additional information regarding the gamma levels or radon testing, please feel free to call. We can supply you with a list of radon testing companies or we can provide this service to you for the normal fee. Additional information regarding radon may be obtained by phoning the toll free number for the State of Florida's Office of Toxicology: 1-800-543-8279.

Sincerely,

Tom McNally

Tom McNally
Health Physicist

POLK COUNTY HEALTH DEPARTMENT

Daniel O. Haight, MD
Director

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225 Avenue D, N.W., Winter Haven, FL 33881
Phone (941) 291-5204 / Fax (941) 291-5208

Lynne M. Sweeney, MD, MPH
Assistant Director

BLUFFS OF CHRISTINA			
COMPLAINT INVESTIGATION - RADIATION LEVELS 5/8/98			
		GAMMA (uR/hr)	
LOCATION	AREA	LUDLUM	CORRECTED
[redacted]	Liv Rm / Din Rm	14	9
	Master Bedroom	13	9
	Fl. Room	17	11
	Kitchen	12	8
	Bathroom	12	8
	Bedroom	12	8
	AVERAGE IN	13.33	**8.83**
	Outside front left	22	13
	Clockwise	23	14
	Clockwise	25	15
	Clockwise	24	14
	Clockwise	23	14
	Clockwise	24	14
	Clockwise	40	25
	Clockwise	30	17
	Clockwise	28	16
	Clockwise	28	16
	Clockwise	25	15
	Clockwise	22	13
	Clockwise	22	13
	AVERAGE OUT	25.85	**15.31**
[redacted]	**Outside by sign**	45	**29**
	Enclosed patio	16	10
	Main area	20	12
	AVERAGE IN	18	**11**
[redacted]	**Inside**	21	**13**
	Outside	26	**15**
[redacted]	Family Room	13	9
	Back sitting room	13	9
	Master bedroom	12	8
	Kitchen	11	8
	Bedroom	10	7
	Bathroom	11	8
	AVERAGE IN	11.67	**8.17**
	Outside middle	16	10
	Counterclockwise	21	13
	Counterclockwise	15	10
	Counterclockwise	20	12
	Counterclockwise	28	16
	Counterclockwise	35	21
	Counterclockwise	26	15
	Counterclockwise	26	15
	Counterclockwise	25	15
	Counterclockwise	23	14

LOCATION	AREA	GAMMA (uR/hr) LUDLUM	CORRECTED
[redacted]	Counterclockwise	21	13
	Counterclockwise	20	12
	AVERAGE OUT	23	**13.83**
[redacted]	Master bedroom	15	**10**
[redacted]	old site	45	**29**
	current dirt pile	26	**15**
	current dirt pile	40	**25**
[redacted]	Outside	24	**14**
[redacted]	Out SW comer	35	21
	Clockwise	35	21
	Clockwise	28	16
	Clockwise	27	16
	Clockwise	27	16
	Clockwise	29	17
	Clockwise	35	21
	Clockwise	35	21
	Clockwise	30	17
	Clockwise	30	17
	AVERAGE OUT	31.1	**18.3**
	Inside	16	11
	Inside	11	8
	AVERAGE IN	13.5	**9.5**
[redacted]	Out SW comer	28	16
	clockwise	21	13
	clockwise	19	12
	clockwise	21	13
	clockwise	25	15
	clockwise	30	17
	clockwise	35	21
	clockwise	30	17
	AVERAGE OUT	26.13	**15.5**
	Sun porch	15	10
	Liv Rm / Din Rm	14	9
	Kitchen	13	9
	Frt Bedroom	11	8
	Bathroom	11	8
	Bedroom	11	8
	AVERAGE IN	12.5	**8.67**
[redacted]	[redacted]		

POLK CO. HEALTH LAB Fax:941-291-5208

** Transmit Conf. Report **

May 12 '98 8:55

POLK CO. HEALTH LAB ---> 9416449429	
No.	0001
Mode	NORMAL
Time	2'51"
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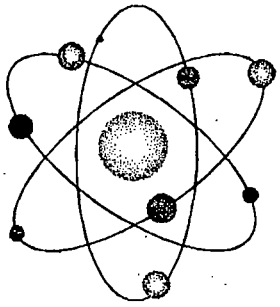

TO: [redacted] **FAX:** 644-9429	**FROM:** TOM MCNALLY Radiological Health Section Polk County PHU **Phone:** 941-291-5204 **Fax:** 941-291-5208

Number of pages including cover: 5

Comments: RADIATION MEASUREMENTS

Signed: Tom McNally

FAX

TO: John Richards FAX: 404-562-8896	FROM: Radiological Health Section Polk County Health Dept. **Phone:** 863-291-5204 **Fax:** 863-291-5208

Number of pages including cover: 5

Comments: Please call if you need clarification.

Signed: Lesley Hall

Christina Bluffs

John Richards

404 562 8648

FAX 8896

LOCATION	AREA	GAMMA (uR/hr) LUDLUM	GAMMA (uR/hr) CORRECTED	(pCi/l) RADON
[redacted]	Counterclockwise	21	13	
	Counterclockwise	20	12	
	AVERAGE OUT	23	**13.83**	
[redacted]	Master bedroom	15	**10**	
Dirt pile	old site	45	**29**	
Dirt pile	current dirt pile	26	**15**	
Dirt pile	current dirt pile	40	**25**	
[redacted]	Outside	24	**14**	
[redacted]	Out SW corner	35	21	
	Clockwise	35	21	
	Clockwise	28	16	
	Clockwise	27	16	
	Clockwise	27	16	
	Clockwise	29	17	
	Clockwise	35	21	
	Clockwise	35	21	
	Clockwise	30	17	
	Clockwise	30	17	
	AVERAGE OUT	31.1	**18.3**	
	Inside	16	11	
	Inside	11	8	
	AVERAGE IN	13.5	**9.5**	
[redacted]	Out SW corner	28	16	
	clockwise	21	13	
	clockwise	19	12	
	clockwise	21	13	
	clockwise	25	15	
	clockwise	30	17	
	clockwise	35	21	
	clockwise	30	17	
	AVERAGE OUT	26.13	**15.5**	
	Sun porch	15	10	
	Liv Rm / Din Rm	14	9	***13.8***
	Kitchen	13	9	
	Frt Bedroom	11	8	
	Bathroom	11	8	
	Bedroom	11	8	
	AVERAGE IN	12.5	**8.67**	
[redacted]	[redacted]			**28.7**

BLUFFS OF CHRISTINA				
COMPLAINT INVESTIGATION - RADIATION LEVELS 5/8/98				
		GAMMA (uR/hr)		(pCi/l)
LOCATION	AREA	LUDLUM	CORRECTED	RADON
[redacted]	Liv Rm / Din Rm	14	9	11.2
	Master Bedroom	13	9	
	Fl. Room	17	11	
	Kitchen	12	8	
	Bathroom	12	8	
	Bedroom	12	8	
	AVERAGE IN	13.33	**8.83**	
	Outside front left	22	13	
	Clockwise	23	14	
	Clockwise	25	15	
	Clockwise	24	14	
	Clockwise	23	14	
	Clockwise	24	14	
	Clockwise	40	25	
	Clockwise	30	17	
	Clockwise	28	16	
	Clockwise	28	16	
	Clockwise	25	15	
	Clockwise	22	13	
	Clockwise	22	13	
	AVERAGE OUT	25.85	**15.31**	
Clubhouse	**Outside by sign**	45	**29**	
Clubhouse	Enclosed patio	16	10	
Clubhouse	Main area	20	12	
Clubhouse	***AVERAGE IN***	18	**11**	
Shop	**Inside**	21	**13**	
Shop	**Outside**	26	**15**	
[redacted]	Family Room	13	9	**10.2**
	Back sitting room	13	9	
	Master bedroom	12	8	
	Kitchen	11	8	
	Bedroom	10	7	
	Bathroom	11	8	
	AVERAGE IN	11.67	**8.17**	
	Outside middle	16	10	
	Counterclockwise	21	13	
	Counterclockwise	15	10	
	Counterclockwise	20	12	
	Counterclockwise	28	16	
	Counterclockwise	35	21	
	Counterclockwise	26	15	
	Counterclockwise	26	15	
	Counterclockwise	25	15	
	Counterclockwise	23	14	

FLORIDA DEPARTMENT OF HEALTH

Lawton Chiles
Governor

James T. Howell, M.D., M.P.H.
Secretary

INTEROFFICE MEMORANDUM

DATE: May 27, 1998

TO: Tom McNally, Health Physicist
Polk County Health Department

FROM: Lillian Weitzel, Chemist II LW
Environmental Section

SUBJECT: Soil Samples for Radium, Thorium, and Uranium (NORM)

We have analyzed the two soil samples which you took May 19, 10:15 a.m., from a backyard at [redacted] These are split samples with Stan Waligora, CHP. The samples were analyzed for gamma emitting radionuclides using a P-type intrinsic germanium detector, with the following results:

			pCi/GRAM ± 1σ COUNTING ERROR					
LAB #	SITE	DEPTH	K-40	Cs-137	Ra-226	Th-232	U-235	U-238
276Z	Bluffs # 1	0 - 6"	0.35 ± 0.05	0.145 ± 0.004	16 ± 2	0.33 ± 0.01	0.30 ± 0.03	10.9 ± 0.5
275Z	Bluffs # 2	6 - 10"	0.23 ± 0.06	0.101 ± 0.004	18.2 ± 0.7	0.38 ± 0.02	0.34 ± 0.04	13.3 ± 0.7

If we can be of any further service, please let us know.

Lawton Chiles
Governor

FLORIDA DEPARTMENT OF HEALTH

James T. Howell, MD, MPH
Secretary

May 19, 1998
Bluffs of Christina
Gamma Reading Comparisons

LOCATION	Gamma Readings in micro-R per hour (uR/hr) PIC	PCHD SN 7059	PCHD SN 7152	WALIGORA LUDLUM 19
Clubhouse outside near sign; at one meter above ground.	23	45	45	43
[redacted] outside yard south side at one meter.	13.5	30	25	26
[redacted] outside backyard near fence at one meter.	21	40	40	40

Above readings taken on 5-19-98.
PIC = Pressurized Ion Chamber readings (Secondary standard, accurate measurement)
PCHD = Polk Co. Health Dept. Ludlum Mod. 12-S readings.
Waligora = Stan Waligora's Ludlum Mod. 19 readings.

Above measurements made in the presence of:
Stan Waligora, Jr., CHP, Pres. Environmental Dimensions, Albuquerque, NM
Andrew Gross, Pres. Radiation Protection Services, Baton Rouge, LA
Wesley Nall, Health Physicist Supervisor, Polk Co. Health Dept.
Robert Ammons, Health Physicist, Polk Co. Health Dept.
Tom McNally, Health Physicist, Polk Co. Health Dept.

Soil samples also taken at the 3rd location above. (0"-6" deep; 6"-10" deep)
Both samples were split: To be analyzed by the State of Fl. Office of Radiation Control's Lab in Orlando and a private lab obtained by Mr. Waligora or Mr. Gross.

Prepared by: Tom McNally
Tom McNally, Health Physicist
Polk County Health Dept.

BLUFFS_2.XLS

POLK COUNTY HEALTH DEPARTMENT

Daniel O. Haight, MD
Director

RADIOLOGICAL HEALTH SECTION / WATER TESTING LABORATORY
225 Avenue D, N.W., Winter Haven, FL 33881
Phone (941) 291-5204 / Fax (941) 291-5208

Lynne M. Sweeney, MD, MPH
Assistant Director

Survey of Radioactive Waste Materials in The Bluffs condominium community in Christina area of Lakeland, Florida; a preliminary report

Radiation Protection Services
LSU - LBTC
S. Stadium Rd.
Baton Rouge LA 70803

291-5208

Wesley:
For your information. This received from Andrew Gross [redacted]

Preliminary Report - The Bluffs, Lakeland Florida

Background

In April and May 1998, Radiation Protection Services technicians (RPS) performed a cursory radiological assessment of the listed property located in Lakeland, Polk County, Florida.

The property (known as The Bluffs) is located in an area known as Christina in the southern section of the town of Lakeland. The Bluffs was developed on an area known to have been used for phosphate mining and waste disposal after depletion of the phosphate reserves. The Bluffs consists of approximately 150 individually owned townhomes and commonly owned roads, park-like areas and clubhouse.

RPS personnel were dispatched to the property to perform an initial site gamma radiation survey. The objective of this survey was to determine if radioactive material had been deposited on the property. Due to the rapid nature of the survey, the survey should be used for identification purposes only and is not appropriate for the performance of dose calculation or reconstruction.

This report details the activities regarding the surveys and measurements taken on the property. Radiological surveys were performed under the direction of Andrew Gross with an RPS-trained technician. The technician was trained in radiation protection fundamentals. Training outlines are attached.

Methods

The property was surveyed for surface contamination with Ludlum radiation survey instruments (Model 3 meters with Model 44-2 NaI probes) The meters are calibrated to a Cesium 137 standard by the manufacturer at an interval of not greater than one year or if an out of service condition exists. (See instrument notes)

Prior to surveying, the instrument was checked to ensure it was within calibration. The response of the instrument was checked utilizing a radioactive source and the results recorded. In addition, the batteries and physical condition of the instrument was checked to ensure proper operation.

The instrument was set on fast response. The technicians slowly traversed the areas to be surveyed holding the detector about one half (1/2) inch from the surface.

When an audible increase was detected the instrument is switched to slow response and the level of radiation was determined and recorded.

All personnel were checked for loose contamination at the end of work daily. These checks were performed using a Ludlum Model 3 count rate meter with an attached geiger-mueller tube pancake probe. Any contamination found on personnel above background levels was washed off and the area re-surveyed.

Preliminary Report - The Bluffs, Lakeland Florida

Instrument Notes

As discussed above, the surveys are performed only as an indication of the presence of radioactive materials at levels above natural background for the area. However, identical instruments, using identical calibrations, are used in several state and federal agencies to determine regulatory compliance. In the State of Louisiana, for instance, radiation measurements on equipment or material greater than 50 microRoentgen per hour results in the issuance of a General Radioactive Material License. This licensing requires the owners of the material to take specific steps to control access to and spread of the material including implementation of Health and Safety Procedures and training, posting of the area with "Caution - Radioactive Material" signs, and documenting dose to exposed personnel.

Soil Concentration Notes

Most state radiation regulations controlling soils are based on concentrations of radioactive material in the soil rather than external gamma dose rates from the soil. These limits, which are based on EPA Mining regulations and suggested state regulations provide for maximum soil concentrations of 5 picoCurie per gram Ra-226 in the first 6" layer of soil and 15 picoCurie per gram Ra-226 in any subsequent 6" layer. Although specific testing for The Bluffs has been performed, results have not yet been received. However, our experience in the area over the last 16 months has determined that typical concentrations in mined out and waste disposal areas are 35 picoCurie per gram Ra-226. In addition, other radioactive isotopes including Thorium and Uranium have been identified.

Dose Notes

Although the instruments used for The Bluffs survey are not designed to determine "effective dose", experience, based on dosimetry studies performed in the area over the past 16 months has shown that typically 50 % of the measured exposure will be absorbed as dose.

In addition, when calculating dose, several other factors or "pathways" must be considered. These pathways are described below:

1. Inhalation - this includes blown dust particles and Radon gas inhalation (see Radon note which follows).
2. Ingestion - this includes swallowing of dust particles, contaminated vegetation or water.
3. Direct Gamma - this includes exposures, such as those measured in the field, which penetrate the body directly.

Dose "limits" are generally set for a pre-defined "acceptable risk" as determined by various governmental agencies. Acceptable risk doctrine determines an "acceptable"

Preliminary Report - The Bluffs, Lakeland Florida

number of cancers attributable to the exposures. Present maximum dose limits are 100 milliRem per year (100,000 microRem per year) Total Effective Dose Equivalent (dose attributable to all pathways, including Radon gas). However, the EPA recently released a document, a copy of which is attached, which allows for a maximum of 15 milliRem per year (15,000 microRem per year) Total Effective Dose Equivalent.

Radon Notes

Radon gas levels determined by Polk County in a study recently performed ranged from 10 - 28 picoCurie per liter in The Bluffs homes. Considering the EPA considers 4 picoCurie per liter to be an unacceptable level which requires remediation, the levels found in The Bluffs homes are significant. The dose attributable to Radon within the homes may be so large as to make the dose attributable to the direct gamma exposures insignificant in comparison. *We recommend further significant study of the Radon levels within the homes.*

A study completed in 1978 by the Radiological Health Services of the Florida Department of Health and Rehabilitative Services found Radon concentrations in Polk County homes built on mining waste resulted in, "significant numbers of persons whose annual lung dose equivalent exceed MPD (maximum permissible dose) recommendations of the NCRP (National Commission on Radiation Protection)." In the same report, the US EPA described the Radon levels as "doubling the risk of lung cancer with ten years of exposure." A copy of this report will be sent along with the original printing of this report.

Conclusions

This property has been found to contain radioactive material as described below. Although some initial solid sampling has been performed, results of these tests are not yet available. The property requires further analysis to determine health risks, radiological and chemical clean up and remediation costs, and property damage estimates.

(numbers in results in microRoentgen per hour)

Property	Outdoor Avg / High (uR/h)	Indoor Avg / High (uR/h)
370 Sweetbrier	40 - 50 / 70 (behind sunroom)	20 - 25 / 25
6733 Trail Ridge	35 - 40 / 60 (behind home)	10 - 15 / 20 (in study)
6761 Trail Ridge	30 - 35 / 45 (behind home)	10 - 15 / 15
6719 Trail Ridge	30 - 40 / 60 (behind home at fence)	10 - 15 / 35 (sunroom edge)

Preliminary Report - The Bluffs, Lakeland Florida

Property	Outdoor Ave / High (uR/h)	Indoor Ave / High (uR/h)
[redacted]	30 - 35 / 40 (near patio)	10 - 15 / 20 (back bedroom)
[redacted]	35 - 40 / 60 (throughout backyard)	15 - 20 / 40 (back porch area)
[redacted]	30 - 40 / 70 (backyard)	15 - 20 / 20
[redacted]	40 - 50 / 60 (backyard)	12 - 15 / 20 (living room)
Clubhouse area	30 - 40 / 70	20 - 25 / 25
Background	3 - 5	5 - 7

(background readings were determined by testing several areas on Florida Ave., Highway 540A and Shepherd Rd.)

References

1. Title 10, Florida Administrative Code, Annotated 10D/91.1104
2. 10 CFR Parts 19 and 20
3. Florida Radiation Regulations
4. Study of Radon Daughter Concentrations in Structures in Polk and Hillsborough Counties, 1978, Florida Department of Health and Rehabilitative Services
5. U. S. Nuclear Regulatory Commission, Regulatory Guide 8.2, "Guide for Administrative Practices in Radiation Monitoring"
6. U. S. Nuclear Regulatory Commission, Regulatory Guide 8.7, "Instruction for Recording and Reporting Occupational Radiation Exposure Dose"
7. U. S. Nuclear Regulatory Commission, Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection"
8. U. S. Nuclear Regulatory Commission, Regulatory Guide 8.25, "Air Sampling in the Workplace"
9. U. S. Nuclear Regulatory Commission, Regulatory Guide 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure"
10. U. S. Nuclear Regulatory Commission, Regulatory Guide 8.34, "Monitoring Criteria and Methods to Calculate Occupational Radiation Exposure Data"
11. U. S. Nuclear Regulatory Commission, Regulatory Guide 8.36, "Radiation Exposure to the Embryo or Fetus"
12. 11.29 CFR 1910.96
13. NUREG / CR - 5849, Radiological Surveys in Support of License Termination

Preliminary Report - The Bluffs, Lakeland Florida

A complete listing of reference documents, as well as individual reports for each dwelling surveyed will be provided upon completion of the Final Report.

Disclaimer:

Radiation Protection Services has provided this report based on the information provided in part by the client, along with information gathered in investigations of the property, and within the confines of the clients budget. Property boundaries, unidentified areas, buried waste and other circumstances could result in the volumes and costs actually being significantly higher than estimated here. No warranty is made as to the accuracy of the data except that information actually gathered by RPS personnel.

CUSTOMER Environmental Dimensions, Inc.
ATTENTION Stanley J. Waligora
ADDRESS 8205 Spain NE Suite 8209-D
CITY Albuquerque, NM 87109
W.O. NO. 98-05-247

Thermo NUtech
7021 Pan American Highway, N.E.
Albuquerque, New Mexico 87109
Phone (505) 345-3461
FAX (505) 761-8416

REPORT OF ANALYSIS

Soil - Gamma Spectroscopy 05/21/98
MATRIX/ANALYSIS CUSTOMER ORDER NUMBER SAMPLES RECEIVED

Customer Identification	Date Collected	Type of Analysis	Sample Weight Wet/Dry (g)	pCi/g(dry)	Analysis Date
980409-01	04/09/98	Gamma	284.5/254.3		06/10/98
		Pb212		2.02±0.73	
		U238		58.1±7.17	
		Ra226		50.8±1.41	
		Pb214		60.6±1.51	
		Bi214		52.3±1.45	
		U235		3.88±0.61	
980519-01	05/19/98	Gamma	447.0/452.5		06/19/98
		Ra228		<1.43	
		Pb212		0.70±0.37	
		U238		24.5±5.11	
		Ra226		16.2±0.75	
		Pb214		19.6±0.84	
		Bi214		16.7±0.77	
		U235		1.17±0.33	
980519-02	05/19/98	Gamma	335.8/318.7		06/19/98
		Ra228		<1.67	
		U238		11.8±3.1	
		Ra226		11.5±0.58	
		Pb214		13.0±0.61	
		Bi214		11.8±0.60	
		U235		0.96±0.31	

The results relate only to the sample(s) tested.
This report should not be reproduced except in full.

☐ REPORTED VIA TELEPHONE ☐ FAX

Mary Ramos, Data Analyst Kathy Burnham, Quality Assurance

REPORTED BY [signature] DATE 07/02/98 APPROVED BY: Kathy Burnham DATE 7-2-98

BLUFFS OF CHRISTINA				
COMPLAINT INVESTIGATION - RADIATION LEVELS 5/8/98				
		GAMMA (uR/hr)		(pCi/l)
LOCATION	AREA	LUDLUM	CORRECTED	RADON
[redacted]	Liv Rm / Din Rm	14	9	**11.2**
	Master Bedroom	13	9	
	Fl. Room	17	11	
	Kitchen	12	8	
	Bathroom	12	8	
	Bedroom	12	8	
	AVERAGE IN	13.33	**8.83**	
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	Clockwise	25	15	
	Clockwise	22	13	
	Clockwise	22	13	
	AVERAGE OUT	25.85	**15.31**	
Clubhouse	**Outside by sign**	45	**29**	
Clubhouse	Enclosed patio	16	10	
Clubhouse	Main area	20	12	
Clubhouse	***AVERAGE IN***	18	**11**	
Shop	**Inside**	21	**13**	
Shop	**Outside**	26	**15**	
[redacted]	Family Room	13	9	**10.2**
	Back sitting room	13	9	
	Master bedroom	12	8	
	Kitchen	11	8	
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	AVERAGE IN	11.67	**8.17**	
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	Counterclockwise	35	21	
	Counterclockwise	26	15	
	Counterclockwise	26	15	
	Counterclockwise	25	15	
	Counterclockwise	23	14	

LOCATION	AREA	GAMMA (uR/hr) LUDLUM	GAMMA (uR/hr) CORRECTED	(pCi/l) RADON
[redacted]	Counterclockwise	21	13	
	Counterclockwise	20	12	
	AVERAGE OUT	23	**13.83**	
[redacted]	Master bedroom	15	**10**	
Dirt pile	old site	45	**29**	
Dirt pile	current dirt pile	26	**15**	
Dirt pile	current dirt pile	40	**25**	
[redacted]	Outside	24	**14**	
[redacted]	Out SW corner	35	21	
	Clockwise	35	21	
	Clockwise	28	16	
	Clockwise	27	16	
	Clockwise	27	16	
	Clockwise	29	17	
	Clockwise	35	21	
	Clockwise	35	21	
	Clockwise	30	17	
	Clockwise	30	17	
	AVERAGE OUT	31.1	**18.3**	
	Inside	16	11	
	Inside	11	8	
	AVERAGE IN	13.5	**9.5**	
[redacted]	Out SW corner	28	16	
	clockwise	21	13	
	clockwise	19	12	
	clockwise	21	13	
	clockwise	25	15	
	clockwise	30	17	
	clockwise	35	21	
	clockwise	30	17	
	AVERAGE OUT	26.13	**15.5**	
	Sun porch	15	10	
	Liv Rm / Din Rm	14	9	***13.8***
	Kitchen	13	9	
	Frt Bedroom	11	8	
	Bathroom	11	8	
	Bedroom	11	8	
	AVERAGE IN	12.5	**8.67**	
[redacted]	[redacted]			**28.7**

5/8/98

Bluffs of Christina

Corrected # & address

Written report.

Opinion

[redacted]

Written Report (crossed out)

644-9429

then pless ? (as directed) *51

Fax

Upton Health Dept Stationary

W/ Summary

Leave Radon Info

@ 11 uR/hr

= 96 mRem/yr.

@ 6 uR/hr

= 53 mRem/yr.

Chest x-Ray ~ 15 mRem

96
- 53
43 mRem/yr more than Avg

⟹ ~ 3 chest x-rays

S/N 7152

[redacted]

Radon detectors
6719
6709

Inside

	pCi/L
LR/DR	14 - 9
MBR	13 - 9
FL Room	17 - 11
Kitchen	12 - 8
Bath	12 - 8
BR	12 - 8

Outside entire 4 unit structure

Front left Corner → clockwise

22 - 13
23 - 14
25 - 15
24 - 14
23 - 14
24 - 14
40 - 25
30 - 17
28 - 16
28 - 16
25 - 15
22 - 13
22 - 13

Clubhouse

Outside by sign
45[redacted] - (29)

Inside -
Enclosed Patio - 16 [redacted] (10)
Main area - 20 [redacted] (16)

Shop
Inside where soil removed - 21 (13)

Outside - 24 [redacted] (15)

[redacted]

uR/hr

Family Room — 13 - (9)
Back Sitting Room - 13 - (9)
M Bedroom — 12 - (8)
Kitchen — 11 - (8)
Bedroom — 10 - (7)
Bathroom — 11 - (8)

Outside
Start - middle - Counter clockw

16 - (10)
21 - (13)
15 - (10)
20 - (12)
28 - (16)
35 - (21)
26 - (15)
26 - (15)
25 - (15)
23 - (14)
21 - (13)
20 - (12)

[redacted]

Inside
M Bedroom — 15 (10)

Old Site of dirt pile - 45 uR/hr (29)
Dirt pile - 26 (15) 40 (25)

[redacted]

Outside - 24 - (14)

[redacted]

Outside
~~D~~ W Corner → clockwise

~~35~~ - (21)
35 - (21)
28 - (16)
27 - (16)
27 - (16)
29 - (17)
~~35~~ - (21)
35 - (21)
30 - (17)
30 - (17)

Inside
16 — 11
(10) - (8)

[redacted]

Outside SW corner - clockwise

28 - (16)
21 - (13)
19 - (12)
21 - (13)
25 - (15)
30 - (17)
35 - (21)
30 - (17)

Inside -

Sun Porch - 15 - (10)
LR/DR - 14 - (9)
Kitchen - 13 - (9)
Front bedroom - 11 - (8)
Bathroom - 11 - (8)
Bedroom - 11 - (8)

5/19/98

BLUFFS

	PIC	7059	7152	LUD 19 S.W.
Clubhouse - out @ sign @ 1 meter & on ground.	23	45	45	43
[redacted] S. Side gold - outdoor	13.5	30	25	26
* [redacted] Out - Back - far back @ fence	21	40	40	40

SOIL SAMPLES TAKEN (& SPLIT) ① 0'-6" ② 6'-10"

WJ STAN WALIGORA, JR CHP President Albuquerque, NM Environmental Dimensions, Inc

& Andrew Gross, President, Radiation Protection Services Baton Rouge, La.

Polk Co. Health

~~Incident~~ Sample Tag

Sample Tag: BLUFFS #1 Incident #: FL N/A

Collected by: T. MCNALLY

on Date: 5-19-98 at Time: 10:15 AM

Sample Description:
Soil Sample 0-6"
Split Sample with
STAN WALIGORA, CHP

Sampling Location:
Back yard @ [redacted]

Radiation readings taken at time of collection or at hot line

Contact: _____ mR/h with _____
(N/A mR/h background reading)

1 foot: _____ mR/h with _____
(_____ mR/h background reading)

Swipe: _____ CPM with _____
(_____ CPM background reading)

Polk Co Health

~~Incident~~ Sample Tag

Sample Tag: BLUFFS #2 Incident #: FL N/A

Collected by: T. McNally

on Date: 5-19-98 at Time: 10:15 PM

Sample Description:
Soil Sample 6-10"
SPLIT SAMPLE WITH
STAN WALIGORA, CHP.

Sampling Location:
BACK YARD @ [redacted]

Radiation readings taken at time of collection or at hot line

Contact: _____ mR/h with _____
(N/A mR/h background reading)

1 foot: _____ mR/h with _____
(_____ mR/h background reading)

Swipe: _____ CPM with _____
(_____ CPM background reading)

FAX

TO: [redacted] BLUFFS OF CHRISTINA **FAX:** ~~619-8789~~	**FROM:** TOM MCNALLY Radiological Health Section Polk County PHU **Phone:** 941-291-5204 **Fax:** 941-291-5208

Number of pages including cover: 2

Comments: GAMMA READING COMPARISONS

Signed: Tom

POLK CO. HEALTH LAB Fax:941-291-5208

** Transmit Conf.Report **

May 19 '98 15:51

POLK CO. HEALTH LAB ---> 9416449429	
No.	0004
Mode	NORMAL
Time	1'17"
Pages	2 Page(s)
Result	O K

FLORIDA DEPARTMENT OF HEALTH

POLK COUNTY HEALTH DEPT.
Radiological Health Office
225 Ave. D, N.W.
Winter Haven, FL 33881
Phone (941) 291-5204
FAX (941) 291-5208

EPA RMP ID # 1350000

State of Florida Radon Measurement Business Certification # RB1086

RADON MEASUREMENT REPORT

[redacted]

Testing Information

Address of Building Tested: SAME AS ABOVE

Type of Radon Test: SHORT TERM SCREENING

Testing Device Used: () "E-Perm" Short-term electret radon monitor
(Rad Elec, Inc.)
(X) 4 inch charcoal canister (Mod. RA40VC)
(F & J Specialty Products, Inc.)

Start Date	Start Time	Stop Date	Stop Time
5-8-98	2:58 PM	5-11-98	10:35 AM

Number of Hours Sampled: 67.6 **Date of Analysis:** 5-11-98

Comments: OPEN HOUSE CONDITIONS EXISTED AT START OF TEST. RADON LEVEL MAY BE GREATER WITH CLOSED HOUSE CONDITONS FROM START TO END.

Test Results

This analysis represents the radon-222 concentration in the air only during the sampling period. Your measurement results are reported in picoCuries per liter (pCi/l). The results are as follows:

Location	Device #	Result (pCi/l)
LIVING ROOM	D-289	13.8

(Please see reverse side for interpretation of results)

Radon Measurement Specialist: Tom McNally Date: 5-12-98
EPA RMP ID #: NA State of Florida Certification #: RO857

Interpretation of Results

If the result of your initial short-term radon test is **less than 4 pCi/l**, no further testing is necessary. However, since radon levels change over time, you may want to test again sometime in the future, especially if living patterns change.

If the result of your initial short-term radon test is **equal to or greater than 4 pCi/l**, a follow-up measurement is recommended. Follow-up measurements are conducted to confirm that radon levels are high enough to warrant mitigation. There are two types of follow-up measurements that may be conducted, and the choice depends, in part, on the results of the initial test. An initial measurement result of **10 pCi/l or greater** should be followed up by a second short-term test under closed-building conditions. If the result of the initial measurement is **between 4 pCi/l and 10 pCi/l**, the follow-up test may be made with either a short-term or a long-term method. Long-term tests are conducted for longer than 90 days, and give a better estimate of the year-round average radon level. On the other hand, short-term tests yield results more quickly and can be used to make mitigation decisions. If the long-term follow-up test result is 4 pCi/l or higher, EPA recommends remedial action. If the average of the initial and second short-term results is equal to or greater than 4 pCi/l, radon mitigation is recommended.

If such mitigation work is required, the EPA recommends the use of EPA (RCP) listed and/or State of Florida listed mitigation contractors to perform the work. It is also recommended that the building be tested again after it is fixed to be sure that radon levels have been reduced. A list of State certified mitigation companies may be obtained from this office or by phoning the State of Florida Radon Contact at 800-543-8279.

Comments: _____

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For more information on radon and radon testing:

The following EPA publications may be obtained from this office free of charge or by phoning the State of Florida Radon Contact at 800-543-8279:

A Citizen's Guide To Radon
: This publication contains general information on radon, testing strategies, and the risk associated with radon.

Consumer's Guide to Radon Reduction
: This publication contains some general information on radon and radon testing, along with good advice for selecting and working with qualified radon mitigation contractors. Radon reduction techniques are explained in this pamphlet.

Home Buyer's and Seller's Guide to Radon
: This publication provides practical consumer information for home buyers, concerned about radon.

SAMPLE INFORMATION
(For PCPHU Personnel Performed Radon Tests - Charcoal Canister)

Name [redacted]

Addr

City

Reason For Test: ___ Real Estate Other: _____

OPEN-HOUSE CONDITIONS

Testing Device(s) Used: 4 inch Calgon Charcoal Canister

Start Date: 5/8/98 Stop Date: 5/11/98

Device #: D289 Location: 4U RM Start: 14:58 Stop: 10:35

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Comments: (Closed 5/9/98 ~ 18:00)

Radon Measurement Specialist: _____

EPA RMP ID #: _____ State of Fla. Cert. #: _____

****

LABORATORY INFORMATION

Device #: D-289 Sample #: 9004 # Hours: 67.6 Result: 13.8 pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Average Result (Real Estate Protocol): _____ pCi/l

Mail Results To: (Client) _____

_____

_____

Comments: _____

Laboratory Technician: Robert Ammons Analysis Date: 5/11/98

Polk County Health Dept.
Radiological Health Office
225 Ave. D, N.W.
Winter Haven, FL 33881
Phone (941) 291-5204
Fax (941) 291-5208

EPA RMP ID # 1350000

LABORATORY REPORT
Radon Analysis

[redacted]

Testing Information

Address of Building Tested: SAME AS ABOVE

Testing Device Used: 4 inch calgon charcoal canister (AC)
(F & J Specialty Products, Inc.)

Start Date: 5-8-98 Time: 9:00 PM Stop Date: 5-11-98 Time: 10:23 AM

Date Received: 5-11-98 Date of Analysis: 5-11-98

Comments:

Test Results
Test results are reported in units of picoCuries per liter (pCi/l)

Device #	Location	# Hours	Result (pCi/l)
D-290	DINING ROOM	61.4	28.7

(Please see reverse side for interpretation of results)

Laboratory Technician: Tom McNally Date: 5/12/98

Interpretation of Results

If you carefully followed the sampling instructions and maintained closed-house conditions during the test, and if the result of your initial short-term radon test is **less than 4 pCi/l**, no further testing is necessary. However, since radon levels change over time, you may want to test again sometime in the future, especially if living patterns change.

If the result of your initial short-term radon test is **equal to or greater than 4 pCi/l**, a follow-up measurement is recommended. Follow-up measurements are conducted to confirm that radon levels are high enough to warrant mitigation. There are two types of follow-up measurements that may be conducted, and the choice depends, in part, on the results of the initial test. An initial measurement result of **10 pCi/l or greater** should be followed up by a second short-term test under closed-building conditions. If the result of the initial measurement is **between 4 pCi/l and 10 pCi/l**, the follow-up test may be made with either a short-term or a long-term method. Long-term tests are conducted for longer than 90 days, and give a better estimate of the year-round average radon level. On the other hand, short-term tests yield results more quickly and can be used to make mitigation decisions. If the long-term follow-up test result is 4 pCi/l or higher, EPA recommends remedial action. If the average of the initial and second short-term results is equal to or greater than 4 pCi/l, radon mitigation is recommended.

If such mitigation work is required, the EPA recommends the use of EPA (RCP) listed and/or State of Florida listed mitigation contractors to perform the work. It is also recommended that the building be tested again after it is fixed to be sure that radon levels have been reduced. A list of State certified mitigation companies may be obtained from this office or by phoning the State of Florida Radon Contact at 800-543-8279.

Addtitional Comments: _____

_____

_____

_____

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This publication contains some general information on radon and radon testing, along with good advice for selecting and working with qualified radon mitigation contractors. Radon reduction techniques are explained in this pamphlet.

Home Buyer's and Seller's Guide to Radon

This publication provides practical consumer information for home buyers concerned about radon.

SAMPLE INFORMATION
(For PCPHU Personnel Performed Radon Tests - Charcoal Canister)

FIELD INFORMATION

Name: [redacted]

Addres

City:

Reason For Test: ___ Real Estate Other: _____

Testing Device(s) Used: 4 inch Calgon Charcoal Canister

Start Date: 5,8,98 Stop Date: 5,11,98

Device #: D-290 Location: DN. RM. Start: 21:00 Stop: 10:23

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Comments: _____

Radon Measurement Specialist: _____

EPA RMP ID #: _____ State of Fla. Cert. #: _____

****

LABORATORY INFORMATION

Device #: D-290 Sample #: 9007 # Hours: 61.4 Result: 28.7 pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Average Result (Real Estate Protocol): _____ pCi/l

Mail Results To: (Client) _____

_____

_____

Comments: _____

Laboratory Technician: Robert Ammons Analysis Date: 5/11/98

FLORIDA DEPARTMENT OF HEALTH

POLK COUNTY HEALTH DEPT.
Radiological Health Office
225 Ave. D, N.W.
Winter Haven, FL 33881
Phone (941) 291-5204
FAX (941) 291-5208

EPA RMP ID # 1350000

State of Florida Radon Measurement Business Certification # RB1086

RADON MEASUREMENT REPORT

[redacted] Phone:

Testing Information

Address of Building Tested: SAME AS ABOVE

Type of Radon Test: SHORT TERM SCREENING

Testing Device Used: () "E-Perm" Short-term electret radon monitor (Rad Elec, Inc.)
(X) 4 inch charcoal canister (Mod. RA40VC) (F & J Specialty Products, Inc.)

Start Date	Start Time	Stop Date	Stop Time
5-8-98	2:00 PM	5-11-98	10:45 AM

Number of Hours Sampled: 68.8 **Date of Analysis:** 5-11-98

Comments:

Test Results

This analysis represents the radon-222 concentration in the air only during the sampling period. Your measurement results are reported in picoCuries per liter (pCi/l). The results are as follows.

Location	Device #	Result (pCi/l)
LIVING ROOM	D-291	10.2

(Please see reverse side for interpretation of results)

Radon Measurement Specialist: Tom McNally Date: 5-12-98
EPA RMP ID #: NA State of Florida Certification #: RO857

Interpretation of Results

If the result of your initial short-term radon test is **less than 4 pCi/l**, no further testing is necessary. However, since radon levels change over time, you may want to test again sometime in the future, especially if living patterns change.

If the result of your initial short-term radon test is **equal to or greater than 4 pCi/l**, a follow-up measurement is recommended. Follow-up measurements are conducted to confirm that radon levels are high enough to warrant mitigation. There are two types of follow-up measurements that may be conducted, and the choice depends, in part, on the results of the initial test. An initial measurement result of **10 pCi/l or greater** should be followed up by a second short-term test under closed-building conditions. If the result of the initial measurement is **between 4 pCi/l and 10 pCi/l**, the follow-up test may be made with either a short-term or a long-term method. Long-term tests are conducted for longer than 90 days, and give a better estimate of the year-round average radon level. On the other hand, short-term tests yield results more quickly and can be used to make mitigation decisions. If the long-term follow-up test result is 4 pCi/l or higher, EPA recommends remedial action. If the average of the initial and second short-term results is equal to or greater than 4 pCi/l, radon mitigation is recommended.

If such mitigation work is required, the EPA recommends the use of EPA (RCP) listed and/or State of Florida listed mitigation contractors to perform the work. It is also recommended that the building be tested again after it is fixed to be sure that radon levels have been reduced. A list of State certified mitigation companies may be obtained from this office or by phoning the State of Florida Radon Contact at 800-543-8279.

Comments: _____

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Home Buyer's and Seller's Guide to Radon
: This publication provides practical consumer information for home buyers, concerned about radon.

SAMPLE INFORMATION
(For PCPHU Personnel Performed Radon Tests - Charcoal Canister)

FIELD INFORMATION

Name: [redacted]

Address [redacted]

City: [redacted]

Reason For Test: ___ Real Estate Other: ____________________

Testing Device(s) Used: 4 inch Calgon Charcoal Canister

Start Date: 5/8 /98 Stop Date: 5/11/98

Device #: D291 Location: LIU Rm Start: 14:00 Stop: 10:45

Device #: ______ Location: ____________ Start: __:__ Stop: __:__

Device #: ______ Location: ____________ Start: __:__ Stop: __:__

Device #: ______ Location: ____________ Start: __:__ Stop: __:__

Comments: ____________________

Radon Measurement Specialist: ____________________

EPA RMP ID #: __________ State of Fla. Cert. #: __________

****

LABORATORY INFORMATION

Device #: D-291 Sample #: 9005 # Hours: 68.8 Result: 10.2 pCi/l

Device #: ______ Sample #: __________ # Hours: _____ Result: ____ pCi/l

Device #: ______ Sample #: __________ # Hours: _____ Result: ____ pCi/l

Device #: ______ Sample #: __________ # Hours: _____ Result: ____ pCi/l

Average Result (Real Estate Protocol): ______ pCi/l

Mail Results To: ____________________
(Client)

also: 6719 Harry McCarthy Clip outside Front door (2) tests MM Am

Comments: ____________________

Laboratory Technician: Robert Ammons Analysis Date: 5/11/98

FLORIDA DEPARTMENT OF HEALTH

POLK COUNTY HEALTH DEPT.
Radiological Health Office
225 Ave. D, N.W.
Winter Haven, FL 33881
Phone (941) 291-5204
FAX (941) 291-5208

EPA RMP ID # 1350000

State of Florida Radon Measurement Business Certification # RB1086

RADON MEASUREMENT REPORT

[redacted]

Testing Information

Address of Building Tested: SAME AS ABOVE

Type of Radon Test: SHORT TERM SCREENING

Testing Device Used: () "E-Perm" Short-term electret radon monitor (Rad Elec, Inc.)
(X) 4 inch charcoal canister (Mod. RA40VC) (F & J Specialty Products, Inc.)

Start Date	Start Time	Stop Date	Stop Time
5-8-98	1:40 PM	5-11-98	10:20 AM

Number of Hours Sampled: 68.7 **Date of Analysis:** 5-11-98

Comments:

Test Results

This analysis represents the radon-222 concentration in the air only during the sampling period. Your measurement results are reported in picoCuries per liter (pCi/l). The results are as follows:

Location	Device #	Result (pCi/l)
LIVING ROOM	D-293	11.3

(Please see reverse side for interpretation of results)

Radon Measurement Specialist: Tom McNally Date: 5-12-98
EPA RMP ID #: NA State of Florida Certification #: RO857

Interpretation of Results

If the result of your initial short-term radon test is **less than 4 pCi/l**, no further testing is necessary. However, since radon levels change over time, you may want to test again sometime in the future, especially if living patterns change.

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Comments: _____

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Home Buyer's and Seller's Guide to Radon
: This publication provides practical consumer information for home buyers concerned about radon.

SAMPLE INFORMATION
(For PCPHU Personnel Performed Radon Tests - Charcoal Canister)

FIELD INFORMATION

Name [redacted]

Addr

City

Reason For Test: ___ Real Estate Other: Spec'd

Testing Device(s) Used: 4 inch Calgon Charcoal Canister

Start Date: 5/8/98 Stop Date: 5/11/98

Device #: D-293 Location: LV Room Start: 13:40 Stop: 10:20

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Device #: _____ Location: _____ Start: ___:___ Stop: ___:___

Comments: _____

Radon Measurement Specialist: _____

EPA RMP ID #: _____ State of Fla. Cert. #: _____

****

LABORATORY INFORMATION

Device #: D-293 Sample #: 9006 # Hours: 68.7 Result: 11.3 pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Device #: _____ Sample #: _____ # Hours: _____ Result: ____ pCi/l

Average Result (Real Estate Protocol): _____ pCi/l

Mail Results To: (Client) _____

_____

_____

Comments: _____

Laboratory Technician: Robert Ammons Analysis Date: 5/11/98

[redacted]

SITE: Florida Phosphate
BREAK: 19.8
OTHER: V.52

EDI

STANLEY J. WALIGORA, JR., CHP
PRESIDENT

ENVIRONMENTAL DIMENSIONS inc.

8205 SPAIN RD. NE, SUITE 209D, ALBUQUERQUE, NM 87109
PHONE: 505 797-8640 FAX: 505 797-8641

[redacted]